

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of performing semi-automatic tracking of colored objects within a video image sequence comprising the steps of:

separating objects within an initial frame of the video image sequence on the basis of color;

receiving a user-provided input that selects an object of interest ~~identifying~~ from the separated objects ~~an object of interest having~~ by a user identifying a centroid of the object of interest; and

tracking the object of interest through successive frames of the video image sequence using a Kalman predictive algorithm applied to the centroid.

2. (Original) The method as recited in claim 1 wherein the tracking step comprises the steps of:

from the initial frame determining a position and velocity for the centroid;

for each successive frame predicting a position of the centroid;

from the predicted position extracting a connected group of blocks that belong to the object of interest;

measuring the position of the centroid in the successive frame from the connected group of blocks; and

smoothing the measured position and velocity of the centroid.

3. (Original) The method as recited in claim 1 further comprising the steps of:

detecting whether the centroid in the successive frame is within the object of interest and field of view; and

applying an error recovery scheme to re-identify the object of interest in the successive frame.

4. (Currently Amended) A method of tracking a colored object moving relative to a background within a sequence of video image frames, comprising the steps of:

(a) in an initial frame of the sequence, separating objects from the background based on color;

(b) selecting a separated object by a user identifying a reference point within a boundary of the separated object; and

(c) tracking the selected object through successive frames of the video image sequence using a Kalman predictive algorithm applied to the reference point.

5. (Currently Amended) ~~A~~ The method according to claim 4, wherein step (c) includes the steps of determining the position of a centroid of the selected object and applying the Kalman predictive algorithm to the centroid.

6. (Currently Amended) ~~A~~ The method according to claim 4, wherein step (c) includes the steps of determining the position of a centroid based on a color function of the selected object and applying the Kalman predictive algorithm to the centroid.

7. (Currently Amended) ~~A~~ The method according to claim 4, wherein step (c) includes the steps of determining the position of a centroid based on luminance of the selected object and applying the Kalman predictive algorithm to the centroid.

8. (Currently Amended) ~~A~~ The method according to claim 4, wherein each image frame is resolved into multiple blocks and step (a) comprises the step of segmenting the initial frame based on color of the blocks.

9. (Currently Amended) A The method according to claim 8, wherein step (b) includes the step of identifying a color model to which the selected object belongs and step (c) includes the steps of:

predicting the position of a centroid of the selected object in a subsequent frame;_i

determining whether the predicted position of the centroid in said subsequent frame is within a boundary of the selected object in said subsequent frame;_i and,

and, in the event that the predicted position of the centroid in said subsequent frame is not within the boundary of the selected object in said subsequent frame, carrying out a search to identify a block that belongs to the selected color model.

10. (Currently Amended) A The method according to claim 4, wherein each image frame is resolved into multiple blocks and step (c) comprises the steps of:

determining position and velocity of a centroid of the selected object in the initial frame;_i

predicting the position of the centroid in a subsequent frame;_i

from the predicted position of the centroid in said subsequent frame, extracting a connected group of blocks in said subsequent frame that belong to the selected object;_i and,

calculating the position of the centroid of the selected object in said subsequent frame from the connected group of blocks.
